

Appln. No.: 10/799,315  
 Amendment Dated March 23, 2005  
 Reply to Office Action of October 27, 2004

GRY-122US

**Amendments to the Claims:** This listing of claims will replace all prior versions, and listings, of claims in the application

**Listing of Claims:**

1. (Currently Amended) Process for controlling the opening and the closing of Intake valves of a cylinder of an internal combustion engine comprising at least one a first intake valve and at least one a second intake valve -per said cylinder, exclusive of any other Intake valve, each the first and second intake valves permitting a first and a second intake port, respectively, of the cylinder, respectively, to be closed or opened, and being actuated cyclically in terms of opening and closing, characterized in that it wherein the process comprises the following steps during the closing of the first and second intake valves of a the cylinder:

a first step of closing of the first intake valve,

then a second step of closing of the second intake valve, at a time T after closing the first intake valve, the time, T, between the closing of the first Intake valve and the closing of the second intake valve being such that it permits being sufficient to permit the propagation toward the second valve of at least one overpressure generated in the first port by the closing of the first intake valve;

wherein the time T is selected to optimize engine torque at relatively low engine speeds commonly used by drivers.

2. (Currently Amended) Process in accordance with claim 1, ~~characterized in that wherein~~ the time, T, is at least equivalent to ~~the a~~ time necessary for an acoustic wave to travel over ~~the a~~ path between the first intake valve and the second intake valve, using the first and second intake ports.

3. (Currently Amended) Process in accordance with claim 1 or 2, ~~characterized in that wherein~~ the value of the time, T, approximately equals:

$$T = (k * 4 * L1 + L1 + L_{int} + L2)/C0 \pm \lambda L1/C0,$$

In which formula

k is an integer;

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L1 is ~~the~~ a length of the first intake port;

L2 is ~~the~~ a length of the second intake port;

Lint is ~~the~~ a distance between the ~~inlets~~ of the ~~two said~~ first and second intake ports located opposite the first and second valves, respectively;

C0 is ~~the~~ a velocity of sound in ~~the~~ a medium contained in the first and second intake ports, and

$\lambda$  is a number between 0 and 1 ~~and preferably equal to zero~~.

4. (Currently Amended) Process for controlling the Intake valves of an internal combustion engine in accordance with claim 3, ~~characterized in that~~ wherein  $k$  has a value of 1, 2 or 3.

5. (Currently Amended) Process in accordance with claim 1 or 2, ~~characterized in that~~ wherein the closing of the first intake valve is actuated in the vicinity of the close to a mid-course of the a piston in the cylinder after the top dead center (TDC).

6. (Currently Amended) Process in accordance with claim 5, ~~characterized in that~~ wherein the openings of the first and second intake valves are actuated at approximately the ~~same moment~~ simultaneously.

7. (Currently Amended) Process in accordance with claim 5, characterized in that the openings of the first and second intake valves are triggered approximately at the top dead center (TDC) ~~of the~~ during operation of the engine.

8. (Currently Amended) System for controlling the opening and closing of the intake valves of a cylinder of an internal combustion engine comprising at least one first and second intake valves per said cylinder, exclusive of any other intake valve, ~~each the first and second intake valves~~ being actuated cyclically by ~~[[a]]~~ actuating device ~~devices~~ to close or open a first and second intake ports of the cylinder, respectively, ~~characterized in that it~~ wherein the system comprises a central control unit that ~~makes it possible to control~~ controls the actuating devices in terms of the closing of the first and second intake valves in such a way as to actuate the closing of the first intake valve and, then, a time,  $T$ , ~~later~~, after the closing of the first intake valve, the closing of the second intake valve;

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wherein the time T is selected to optimize engine torque at relatively low engine speeds commonly used by drivers.

9. (Currently Amended) System in accordance with claim 8, ~~characterized in that~~wherein the time, T, is ~~such that it is sufficient to permit the permit~~ propagation toward the intake second valve of at least one overpressure generated in the first port by the closing of the first intake valve.

10. (Currently Amended) System in accordance with claim 9, ~~characterized in that~~wherein the time, T, is at least equivalent to ~~the a~~ time necessary for an acoustic wave to travel over ~~the a~~ path between the first intake valve and the second intake valve using the first and second intake ports.

11. (Currently Amended) System in accordance with claim 8 or 10, ~~characterized in that~~wherein the value of the time, T, is approximately

$$T = (k * 4 * L1 + L1 + L_{int} + L2)/C0 \pm \lambda L1/C0,$$

in which formula

k is an integer,

L1 is ~~the a~~ length of the first intake port,

L2 is ~~the a~~ length of the second intake port,

L<sub>int</sub> is ~~the a~~ distance between the inlets of the ~~two~~ first and second intake ports located opposite the first and second intake valves, respectively, and

C0 is ~~the a~~ velocity of sound in ~~the a~~ medium contained in the first and second intake ports, and

$\lambda$  is a number between 0 and 1 ~~and preferably zero~~.

12. (Currently Amended) System in accordance with claim 11, ~~characterized in that~~wherein k has a value of 1, 2 or 3.

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13. (Currently Amended) System in accordance with claim 9, characterized in ~~that wherein a~~ the central control unit controls the closing of the first intake valve ~~in the vicinity of close to the a~~ mid-course of the a piston in the cylinder after the top dead center (TDC).

14. (Currently Amended) System in accordance with claim 13, characterized in ~~that wherein~~ the central control unit controls the actuating devices in such a way as to achieve the openings of the first and second intake valves at approximately the same ~~moments~~ simultaneously.

15. (Currently Amended) System in accordance with claim 14, characterized in ~~that wherein~~ the central control unit controls the actuating devices in such a way that the openings of the first and second intake valves take place approximately at the top dead center ~~of the during~~ operation of the engine.

16. (Currently Amended) System in accordance with claim 8, characterized in ~~that wherein~~ the actuating devices are electromagnetic or electromechanical actuating devices.